

IN THE CLAIMS:

The following is a complete listing of claims in this application.

Claims 1-13 (canceled).

14. (new) Device for measuring relative orientation of at least a first object with respect to a second object free from said first object, or connected to the first object but with independent movement, wherein said orientation is carried out according to at least one degree of freedom, comprising:

- at least one goniometric sensor for each said degree of freedom, constructed and arranged for measuring variation of orientation in a plane;

- at least one constraint generator for each said goniometric sensor, constructed and arranged to cause the sensor to move in said plane;

wherein each said constraint generator comprises a flexible elongated element having a longitudinal axis with a low flexional stiffness in a first plane passing through said axis, and a high flexional stiffness in a second plane orthogonal to said first plane and passing through the axis, said element being flexible only in said first plane.

15. (new) Device according to claim 14, wherein said constraint generator has high stiffness to torsion and to tensile stress.

16. (new) Device according to claim 14, wherein each said goniometric sensor is disposed in a housing that crosses longitudinally said constraint generator, said goniometric sensor measuring the relative angular movement of said objects in a bending plane of said constraint generator.

17. (new) Device according to claim 14, wherein each said constraint generator comprises a plurality of substantially parallel portions of larger cross section alternating with a plurality of portions of smaller cross section, said portions of

smaller cross sections conferring to the structure a larger flexional capacity in a first plane and larger flexional stiffness in a plane orthogonal to the first plane, and a high stiffness to torsion and to tensile stress.

18. (new) Device according to claim 14, wherein each said constraint generator comprises an plate shaped element having bellow-like projections extending therefrom.

19. (new) Device according to claim 18, wherein said projections have structure selected from the group consisting of helical and alternating annular portions having larger and smaller cross sections.

20. (new) Device according to claim 14, wherein at least one said constraint generator comprises flanges orthogonal to said axis for fastening at ends thereof further constraint generators in series or for fastening to objects whose rotation will be measured.

21. (new) Device according to claim 14, wherein said goniometric sensor comprises:

- a flexible elongated element extending between a first and a second object, said element having a neutral axis which does not change in length when bending, and at least one fiber spaced apart from said neutral axis and extending from the first to the second object;

- means for measuring the length variation of said fiber as the relative rotation varies between the first and the second object, the relative rotation being proportional to said length variation.

22. (new) Device for measuring relative orientation of a first object capable of rotating about more axes independent with respect to a second object, comprising a plurality of constraint generators according to claim 14, connected rigidly in series at ends thereof, and having one said constraint generator for each axis of rotation or rotational degree of

freedom, said constraint generators being oriented according to flexion planes, such that each sensor present in a corresponding constraint generator measures bending in a different plane, the relative rotational movement of the first object with respect to the second object being determined by means of a combination of measurements of angular movements in each flexion plane.

23. (new) Device for measuring the rotation of an arm with respect to a shoulder of an individual, comprising three constraint generators according to claim 14, arranged in series and associated with three goniometric sensors, wherein the first constraint generator has a free end integral to the shoulder and is oriented for bending in a first plane, the second constraint generator is in a second plane orthogonal to the first plane, and the third constraint generator is in a third plane orthogonal to the second and having a free end integral to the arm.

24. (new) Device for measuring rotation of a forearm with respect to an arm of an individual, comprising a constraint generator and an associated goniometric sensor according to claim 14, with a first end integral to the arm an opposite end integral to the forearm.

25. (new) Device for measuring rotation of a wrist of an individual with respect to a point on an arm of the individual, the point remaining substantially fixed during the rotation of the wrist, comprising at least one goniometric sensor according to claim 21, arranged with a first end integral to the wrist and an opposite end constrained to the fixed point, said goniometric sensor measuring the rotation of the wrist with respect to a second point of the arm.

26. (new) Data suit for measuring angular rotation of an arm with respect to a shoulder, a forearm with respect to an arm, and a wrist with respect to a point of an arm of an individual, comprising:

- a device for measuring rotation of the arm with respect to the shoulder comprising three constraint generators, arranged in series and associated with three goniometric sensors, wherein the first constraint generator has a free end integral to the shoulder and is oriented for bending in a first plane, the second constraint generator is in a second plane orthogonal to the first plane, and the third constraint generator is in a third plane orthogonal to the second and having a free end integral to the arm;

- a device for measuring the rotation of the forearm with respect to the arm, comprising a constraint generator and an associated goniometric sensor, with a first end integral to the arm and an opposite end integral to the forearm, arranged orthogonally to said device for measuring the rotation of the arm with respect to the shoulder; and

- a device for measuring the rotation of the wrist, comprising at least one goniometric sensor, arranged with a first end integral to the wrist and an opposite end constrained to the fixed point, said goniometric sensor measuring the rotation of the wrist with respect to the second point of the arm arranged with an end integral to the wrist and with the other end constrained to said fixed point, said goniometric sensor measuring the rotation of the wrist with respect to said second point of the arm,

wherein each said constraint generator comprises a flexible elongated element having a longitudinal axis with a low flexional stiffness in a first plane passing through said axis, and a high flexional stiffness in a second plane orthogonal to said first plane and passing through the axis, said element being flexible only in said first plane.